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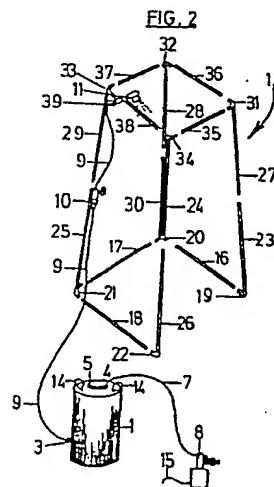
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**(54) Portable shower.**

(57) A portable shower assembly especially for campers and caravanners which comprises the combination of a container for water (1), adapted for optional heating of the water in the container, the container having an upper filling opening (2) and an outlet (3) for draining from near the bottom, a filler cap (4) having a connection socket (5) for an air pressure pipe and an incorporated pressure limiting valve (6), an air pressure pipe (7) for leading to a power driven air pump (8), a water pipe (9) for connection to the water outlet, a valve (10) in the water pipe for controlling water flow, a shower head (11) connected at the distal end of the water pipe, with a collapsible frame (12) and cover (13) erectable to form a shower enclosure. A further embodiment comprises separated containers (66,64) - (84,86), one of which can be heated, together with a mixing valve (98) to provide for mixing the hot and cold water for a shower of suitable temperature.



PORTABLE SHOWER

BACKGROUND OF THE INVENTION

Field of the Invention

This invention lies in the field of portable showers, showers used for campers or similar means of ablution which may be used not only by campers and caravaners but also by others who live without the benefit of permanently installed ablution facilities such as prospectors, civil construction workers, military people in the field and inhabitants of houses, for example, very old houses, which have not had a shower installed.

Description of the prior art

Portable and campers showers have been described but none have been a notable success on the market which is made up, it appears, primarily by campers and caravaners. For this group a portable shower is an optional item and in many camping and caravan sites an alternative over and above established ablution blocks. Therefore, unless the portable shower offers really satisfactory functioning and convenient usage it is not attractive. Comparatively minor shortcomings, therefore, contribute to the commercial failure of this category of products. Thus a portable shower has been described which uses a foot pump for pumping water from a container to a shower head but it seems

that the relative ineffectualness and inconvenience of a foot pump have militated against the general use of this equipment. On the other hand a water pump which is powered, for example, by electricity  
5 consumes energy at a higher rate, thus requiring power delivery which is not easily available in a camping situation. The use of the car battery can so easily lead to a flat battery. Some designs have described pre-pressurising the container for  
10 shower water but this does not work because the shower flow is initially too hard, while the pressure is high and later fails, when the pressure drops or alternatively the container must be only partially filled. Then again, if the pressure is rather high a very  
15 strong shower results which quickly exhausts any reasonable supply of water which can be provided in camping circumstances.

#### Summary of the Invention

An object of this invention is to provide a portable  
20 shower assembly in which is combined the techniques of water delivery by means of pressurised air which is conveniently supplied by an electric air pump with control of that air pressure by means of a pressure limiting valve provided in juxtaposition with the  
25 pressurised air inlet. A further object is to provide

a shower enclosure with convenient mountings for shower head, shower valve, toilet soap, towel and clothes.

5 The portable shower assembly of the invention comprises the combination of a container for water, adapted for optional heating of the water in the container, the container having an upper filling opening and an outlet for draining from near the bottom, a filler cap having a connection socket for an air pressure pipe and an incorporated pressure limiting valve, an air pressure  
10 pipe for leading to a power driven air pump, a water pipe for connection to the water outlet, a valve in the water pipe for controlling water flow, a shower head connected at the distal end of the water pipe, with a collapsible frame and cover erectable to form a shower  
15 enclosure.

The assembly is preferably enhanced in that the frame has an attachment for removably mounting the valve at about waist height and an attachment for removably mounting the shower head at about head height.

20 The cover preferably has sliding fasteners which are vertical along one wall to provide a door for access to the enclosure and peripheral along a roof panel of the cover to permit opening the roof panel in use

and preferably has a pocket on an inside surface for a bar of soap, and a pocket on an inside surface for a towel and/or dry clothing which has a pocket flap.

5 The filler cap construction detail preferably is such that the cap has a side entry bore for the air pipe connection and a side entry bore for the pressure limiting valve, an air bleed-off bore exiting on the top surface of the filler cap with a spring-loaded disc seating on a seat in the bore, an adjustment nut being provided  
10 behind the spring.

#### Brief Description of the Drawings

Figure 1 is an isometric view of the preferred embodiment of the invention,

15 Figure 2 is a similar view showing the device with the cover removed from the enclosure,

Figure 3 is a cross sectional view of the special filler cap of the assembly,

Figure 4 is a side elevation of an embodiment adapted for heating the water,

20 Figure 5 is a side elevation of an alternative assembly in accordance with the invention, and

Figure 6 is a side elevation of a further alternative embodiment in accordance with the invention.

Description of the Preferred Embodiments

As shown in figures 1, 2 and 3 the preferred portable shower assembly comprises a container 1 for water, adapted for optional heating of the water in the container the container having an upper filling opening at 2 and an outlet at 3 for draining water from near the bottom of the container, a filler cap 4 having a connection socket at 5 for an air pressure pipe and also having an incorporated pressure limiting valve 6, (see figure 3), an air pressure pipe 7 for leading to an electrically driven air pump 8, a water pipe 9 for connection to the water outlet 3, a valve 10 (see figure 2), for controlling water flow, a shower head 11 connected at the distal end of the water pipe 9, a collapsible frame 12 and a flexible cover 13 which together form the shower enclosure.

The container 1 has carrying handles 14 and the electric pump 8 has a flex 15 for connection to a 12 volt D.C. supply such as a motor car battery. The frame 12 comprises three straight pipes 16, 17 and 18 which form three sides of a square base periphery and which are joined by four corner pieces 19, 20, 21 and 22 to which are permanently fixed half height uprights 23, 24, 25,

and 26 respectively. The straight bars 16, 17 and 18 fit telescopically into the corner pieces 19, 20, 21 and 22. Into the top ends of the four up-rights 23, 24, 25 and 26 upper half height uprights 27, 28, 29 and 30 respectively fit telescopically and each has its corner piece 31, 32, 33 and 34 respectively fixed permanently to it. Four straight poles 35, 36, 37 and 38 fit telescopically between the corner pieces 31, 32, 33 and 34 and define the four sides of the upper periphery of the frame. The half height leg piece 25 carries a clamp in which the valve 10 can be clamped removably. The half height leg piece 29 carries a mounting clamp 39 into which the shower head 11 can be removably attached. Thus the shower head 11 can either be used attached to the mounting clamp 39 or it can be hand held. The cover 13 has a slide fastener 40 at its front surface extending full height of the cover for entry and exit from the enclosure. A further slide fastener 41 is provided around three sides of the upper periphery of the cover so that the ceiling or roof of the cover can be flapped over to open the shower so that it can be used open topped or alternatively it can be used closed.. Inside one side wall a pocket 42 is provided of a suitable size for holding a cake of soap and also inside a side wall a pocket 43 is provided with a flap 44 into which dry clothing and a towel can be placed. The assembly is

also preferably provided with a separate ground sheet to be fixed at the base. Pegs 45 are provided at along the bottom of the enclosure to hold the cover down.

5 As shown in figure 3 the filler cap 4 has an anti-chamber 46 into which the bore 5 communicates by means of the passage 47 and the bore 6 communicates by means of the passage 48. The bore 48 is threaded so as to receive an inlet grommet for the flexible  
10 air hose which leads to the pump 8. The bore 6 has a seat 49 formed in it and a disc type valve 50 is able to seat on the seat 49 sealingly. A light gauge spring 51 presses against the back of the disc 50 and the tension of the spring can be adjusted by  
15 screwing inwards or outwards a plug 52 which screws in screw threads provided in the bore 6 for this purpose. In this way the pressure limit can be adjusted. An outlet hole 53 is provided in the upper surface of the filler cap 4 so that air vented by means of the pressure  
20 limiting valve disc 50 escapes immediately via the hole 53 upwardly. The lower portion 54 of the cap is screw threaded so as to screw into a threaded filling hole at the top of the container 1. The positioning of the vent hole 53 adjacent the seat 49 and disc 50 provides for  
25 stable bleeding of air to maintain a set maximum pressure, i.e. without flutter.



Preferably a further safety feature is provided in that the filler cap 4 has radially directed holes 100 which are located between the seat area 101 of the cap which seats sealingly onto the opening in the container 1 and a threaded region 102 which screws into that opening. This provision has the effect that the moment the filler cap 4 is unscrewed slightly so as merely to loosen it the pressure inside the container is immediately relieved via the holes 100. The filler cap then requires further unscrewing before it can be removed from the container. This has the valuable safety feature that if a person uncautiously unscrews the filler cap when there is still pressure in the container the cap will not be blown off the opening by that pressure as soon as it disengages from the thread. This would be an important safety provision especially, for example, for children or other inexperienced users.

The cap 6 may have a pipe indicated by broken lines 110 extending to near the bottom of the container 1 for outlet water, the cap screw threaded at 111 to connect the tube 9 with a suitable fitting. This would obviate the exit at 3.

Figure 4 shows a further optional component of the assembly comprising a stand 55 adapted to conveniently carry the container 1 at a height suitable for placing a portable gas burner 56 on its gas tank 57 for heating

the water in the container. For this purpose, however, a specially adapted container 58 is provided which has a central hole or bore extending right through the container from top to bottom 59. This allows passage of hot air from the burner to pass up through the bore 59 and to vent out to atmosphere at the top of the container thereby more effectively utilising the heat available from the burner. In effect the surface area over which the heat from the heated gases of the burner can transfer to the water is increased.

Figure 5 shows a variant wherein there are two, substantially identical tanks 84 and 86, of which the tank 84 is for hot water and the tank 86 is unheated and is for cold water. Each tank has an inlet for water 88 provided with a closure 90. Each tank also has an inlet 92 for pressurised air with the inlets being connected to a common T-junction 94 through tubes 93. Adjacent to the junction 94 there is a pressure relief valve 96 and the air supplied to the tanks is routed through this pressure relief valve 96. As shown the tanks 84 and 86 have their outlets connected by tubes 38 to a common mixing nozzle 98 including a shower rose 99. The mixing nozzle 98 has valves for controlling the supply of hot water and cold water.

Figure 6 shows an embodiment of water supply system of the invention comprising a tank 60 subdivided by an interior baffle 62 into two compartments 64 and 66 which are communication with each other above the baffle 62. The compartment 64 is heated by a gas burner 56 as described previously. The compartment 66 is insulated by a sheet 68 of suitable insulating material, such as asbestos. In the top of the tank there are two water inlets 70 and 72. The inlet 70 is provided with a cap 74 which is provided with an inlet 76 to which a tube 30 for supplying pressurised air is connected. The inlet 62 has a closure 78 to which is fitted a pressure relief valve 26. The tank 60 has an outlet 80 for hot water and an outlet 82 for cold water.

In use water is poured into both compartments 64 and 66 through the inlets 70 and 72. Thereafter the closures 74 and 78 are put in place and air under pressure supplied through the tube 30 to the tank 60. Water under pressure is forced out of the outlet 80 and 82 along tubes, not shown, to a mixing nozzle combined with a shower head.

The container for water is adapted for optional heating

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by being made in a high quality material such as stainless steel preferably, but in particular, by being given a pressure rating of 150 kPa. Preferably the upper wall of the container is provided with a  
5 rubber insert safety plug or a lead insert safety plug or a similar provision which is set, for example, to approximately 90 kPa to blow out should the pressure exceed such a value as a safety precaution. In such an arrangement preferably the pressure limiting valve  
10 in the filler cap is adjusted to provide a limiting pressure of say 45 to 50 kPa as a suitable working pressure to provide a good shower from a suitable shower head whilst at the same time not a too strong shower which would drain the water very quickly.

CLAIMS:

1. A portable shower assembly which comprises the combination of a container for water (1), adapted for optional heating of the water in the container, the  
5 container having an upper filling opening (2) and an outlet (3) for draining from near the bottom, a filler cap (4) having a connection socket (5) for an air pressure pipe and an incorporated pressure limiting valve (6), an air pressure pipe (7) for leading to a  
10 power driven air pump (8), a water pipe (9) for connection to the water outlet, a valve (10) in the water pipe for controlling water flow, a shower head (11) connected at the distal end of the water pipe, with a collapsible frame (12) and cover (13) erectable to  
15 form a shower enclosure.
2. A portable shower as claimed in claim 1, in which the frame (12) has an attachment for removably mounting the valve at about waist height and an attachment (39) for removably mounting the shower head (11) at about  
20 head height.
3. A portable shower as claimed in claim 1, in which the cover (13) has sliding fasteners which are vertical (40) along one wall to provide a door for access to the enclosure and peripheral (41) along a roof panel  
25 of the cover to permit opening the roof panel in use.

4. A portable shower as claimed in claim 1, in which the cover is of plasticised fabric and has a pocket (42) on an inside surface for a bar of soap, and a pocket (43) on an inside surface for a towel  
5 and/or dry clothing which has a pocket flap (44).

5. A portable shower as claimed in claim 1, in which the filler cap (4) has a side entry bore (5) for the air pipe connection and a side entry bore (6) for the pressure limiting valve, an air bleed-off bore (53)  
10 exiting on the top surface of the filler cap with a spring-loaded disc (50) seating on a seat (49) in the bore, an adjustment nut (52) being provided behind the spring.

6. A portable shower as claimed in claim 5, in which  
15 the side entry air pipe connection (5) and the side entry bore (6) for the pressure limiting valve communicate with a common central, vertically disposed bore (46) which forms an antechamber into which inlet air is admitted, from which over-pressure air exits via the  
20 pressure limiting valve and from which air at the limited pressure is admitted to the plenum above the water in the container.

7. A portable shower as claimed in claim 5, in which the filler cap (4) has at least one radially directed  
25 hole (100) providing communication from the

antechamber and a region located between a seat (101) region of the cap which seats on the filling opening and a screw threaded portion (102) of the filler cap which screws into the filling opening.

5           8.    A portable shower assembly which comprises the combination of a container for water (60) which has a heat insulated partition (62) dividing the tank into two halves (66, 64), the container having an upper filling opening (72, 70) and an outlet (82, 80) for  
10           draining from near the bottom, a filler cap (78, 74) having a connection socket for an air pressure pipe (30) and an incorporated pressure limiting valve (26), an air pressure pipe for leading to a power driven air pump, a water pipe (9) for connection to the water  
15           outlet, a valve (10) in the water pipe for controlling water flow, a shower head (11) connected at the distal end of the water pipe, with a collapsible frame (12) and cover (13) erectable to form a shower enclosure.

20           9.    A water supply apparatus which comprises a container for water (1), an air inlet fitting on a top surface (2) of the container, a water outlet pipe with its opening (3) near the bottom of the container, with fittings for attachment of a hose, a filling cap (4) having securing and sealing means to be removably and sealably secured  
25           in the top of the container, the cap incorporating a pressure relief valve (6) which may be left to maintain a predetermined upper pressure limit in the container.

FIG. 1

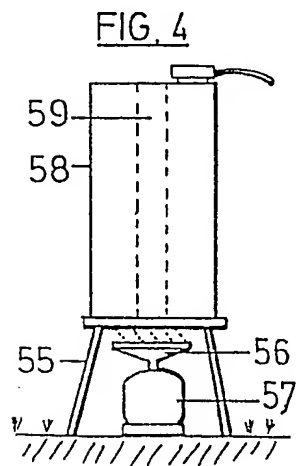


FIG. 2

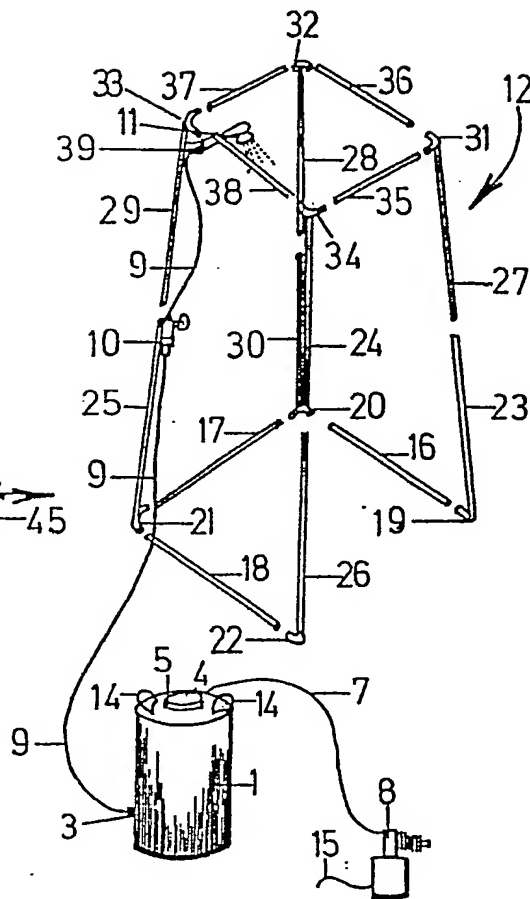


FIG. 3

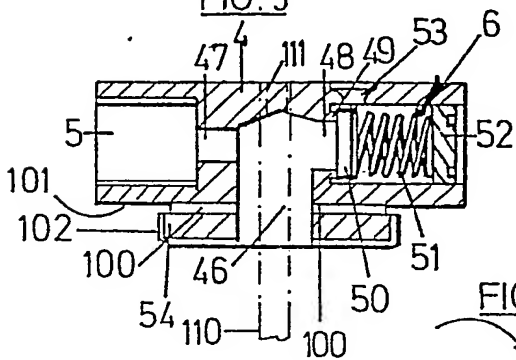


FIG. 5

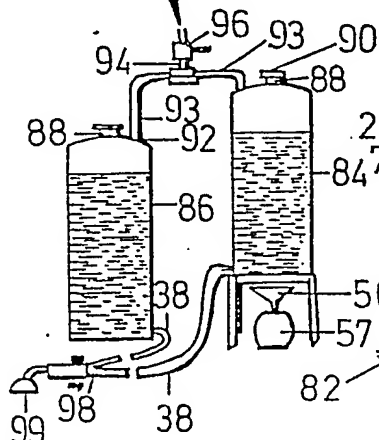
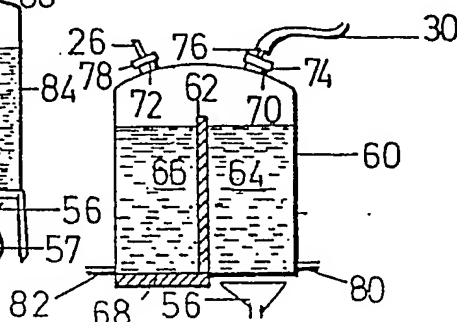


FIG. 6





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European Patent  
Office

## EUROPEAN SEARCH REPORT

Application number

EP 83 30 6424

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. '7)
A	US-A-3 925 828 (KIM) * Column 1, lines 49-71; column 2, lines 1-71; column 3, lines 1-68; column 4, lines 1-10; figures 1-4 *	1-4	A 47 K 3/23
A	--- AU-B- 14 592 (MILCZEWSKI)(1966) * Page 1, lines 25-33; page 2, lines 1-12; figures 1-4 *	1	
A	--- US-A-3 681 788 (LE BLANC) * Column 2, lines 28-68; column 3, lines 1-46; column 5, lines 40-68; column 6, lines 1-29; figures 1,3,13 *	1,2	
A	--- US-A-3 431 565 (NELSON) * Column 1, lines 39-57; column 2, lines 1-15; figures 1,2 *	1	TECHNICAL FIELDS SEARCHED (Int. Cl. '7)
	-----		A 47 K
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 30-01-1984	Examiner SCHOLS W.L.H.
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			